

2009

Business Intelligence in Manufacturing

A White Paper

With increasing competition and ever more demanding customers, manufacturing is never easy. Use of BI can significantly improve both the performance and power of manufacturing reporting.



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1. INFORMATION NEEDS OF MANUFACTURING ARE UNIQUE

With increasing competition and ever more demanding customers, manufacturing is never easy.

While factory floor automation has significantly improved all areas of processing for manufacturing companies, it has also created a staggering amount of data.

IT departments have taken advantage of hardware improvements to economically store the increased data, however there never seems to be enough time or resources to meet the needs of factory managers who face the “fact gap” that exists between the data and the usable information required to make real business decisions.

Agile enterprise is always one step ahead of the competition, which cultivates a responsive environment and delivers major improvements in lead time, product quality, and lower production costs.

Optimizing performance requires managers to have an in depth understanding of how products and customers consume resources and this is why manufacturers adopt more sophisticated cost and profitability analytics - solutions that go beyond production and include the supply chain, support functions and infrastructure.

With a robust and reliable understanding of costs and profitability and their sensitivity to changes in demand, managers are able to make informed and incisive decisions about strategy and tactics.

For certain manufacturers, where the product or the delivery method is tailored for the individual customer, it may be appropriate to use Transactional ABC, calculating cost and profitability analytics at the micro-level by individual customer or individual transaction.

Manufacturing MIS

- *Material* requirements planning (MRP)
 - Determine when finished products are needed
 - Determine deadlines accordingly
- *Manufacturing* resource planning (MRPII)
 - Network scheduling
 - Improve customer service and productivity
- Just in time (JIT) inventory system
 - Inventory and materials delivered right before usage

They adopt Business Intelligence (BI) Reporting & Analytics software as part of their strategic approach for attaining their goals. They are streamlining the information flow both across the organization and through the tiers of the supply chain to reduce cycle and manufacturing times and adapt quickly to market changes.

2. BUSINESS INTELLIGENCE IN MANUFACTURING

Reports generated in high data volume environments normally take a long time to run. To speed up report generation, many systems use tools that employ a summarization technique to reduce the amount of records by aggregating records together with common characteristics. Problem with this technique includes inherent inflexibility and inability to cope with the constantly changing information needs of manufacturing.

BI helps companies in the manufacturing industry:

- *Increase* the value of customer relationships
- *Respond* quickly to changing markets and company sensitivities
- *Accelerate* new product time-to-market
- *Reduce* inventory investment
- *Improve* planning, scheduling, and the procurement schedule
- *Maintain* and develop quality assurance
- *Select* and apply world-class technologies

BI can be used to increase the flexibility and speed of operational reporting.

- Quickly generate established reports
- Easily create ad-hoc reports
- Isolate specific problems
- Analyze data across multiple systems
- Integrate new data sources

BI helps manufacturers give them better visibility of their financial performance and the insight and understanding to improve it. These include solutions for cost and profitability analytics and solutions for operational planning and budgeting. Being able to quickly assess the impact of internal and external changes, BI helps such companies become more agile and better able to keep the bottom line on track.

Manufacturing Scheduling and Production Planning

Manufacturing planning encompasses the hourly / daily / weekly / monthly production and machine schedules across multiple plants or production lines to meet orders or forecasted demand. Success hinges on accurate materials planning. Manufacturing managers, product managers and purchasing analysts review metrics such as production capacity and current inventories to plan appropriate production schedules, ensure raw material availability and make plant reallocation decisions when appropriate. Basic analysis includes real-time status of plant utilization and trends in market demand versus planned production runs. Advanced analysis includes hedging analysis on commodities used in production, forecasting of machine output and linear programming to optimize production resources.

Following business area are prime areas of concern for manufacturers:

- Having a bird's eye-view of customer information which helps sales team to coordinate and collaborate customer interactions.
- Trace the metrics and indicators that improve customer satisfaction.
- Lead time to fulfill customer orders across sales and distribution channels.
- Improve "order promising" (i.e., when a customer is promised delivery or issue resolution) through analysis of historical statistics, expected lead time, and inventory levels
- Analysis of current usage of products to go for new range of products.
- Tracking service, to better predict and prepare inventory and production levels.
- Benchmark distributors, regions, and individual locations against each other in an attempt to foster increased attention to goals and metrics, as well as reward high performers and aid underachievers.

To overcome they need to maintain optimum level of inventory so as to avoid overstock / short-supply and bring innovative and profitable schemes at marketing level. Business Intelligence is the right tool that will helps in achieving this.

BI helps in keeping managers updated / equipped with state-of-the art and exact information that helps in taking critical business decisions rather than going on assumptions.

BI helps improve visibility and communication across increasingly complex manufacturing supply chains, while satisfying customer demands for new products and product enhancements.

Using above one can assess cash-management and monitor operational effectiveness of the payables department to ensure lowest transaction costs. Identify most profitable customers, products, and channels, and understand profitability drivers across regions, divisions, and profit centers. Improve inventory management for those products that consistently fall into backlog due to a lack of appropriate stock levels. Gain visibility into inventory activities to minimize unnecessary expenditures and optimize inventory to conserve working capital. Gain detailed visibility into direct and indirect spending, and identify opportunities for consolidation and reduction of costs. Monitor price, delivery, and product quality to determine best - and worst-performing suppliers.

Business Intelligence tools mainly are being accessed by top Management who need to obtain strategic information that can help them decide the future course of action, help in taking strategic decisions. Business Intelligence is still being more equipped for decision making, predicting trends, analysis, delivering information.

Manufacturing Industry need to look out for a solution that can help them lower lead time, help in reducing production costs, improve product quality, better tracking and improve customer satisfaction. Manufacturing Industry needs to respond quickly to changing market environments. In the current environment delivering the key information to the key people has gained extra importance that can help plan for production, reduce hidden costs, keep optimum level of inventory, and maximize profits.

Changing Customer and Distributor requirements, Internal Operations demand an optimal way of decision making by the manufacturer. Each manufacturer has its own processes, own tacking system, order processing and its own challenges. All this add up to the need of having effective BI system in place and providing results out of it. Again there has been long debate on the quality of data that is available with manufacturing industry as for most of them they have to depend on external parties like retailers, distributors, contractors, suppliers , its own customers, others. If a proper feed is given to Supply Chain and Order management that will definitely ensure deep customer insight and inventory data for better and effective decision making.

One of the challenges that manufacturing industry face is due to changes in demand. If managers have a proper understanding of costs and demand, they can make better decisions. Some of the manufacturer's also have a customer specific costing. Improved Visibility in Procure to Pay is helpful to optimize the supply side performance.

Manufacturing Companies product portfolios are larger to manage, has large number of suppliers to negotiate on cost and quality, maintain huge inventories which need to be tracked and moved to meet customer demands. Along with this there is always a need to analyze / identify customer need, maintain and improve customer delight, add customers so as to remain in business and be profitable. BI definitely helps in making right decisions to overcome these pressures and helps to manage and sustain in business in this complex environments.

"A manufacturing company like ours requires key performance indicators from scattered data. Also rolling out BI to the bottom of the pyramid and not restricting it to the few users helps achieve quick & important business gains in short time in reasonable costs. Forward visibility and data analysis gives right tools to middle and senior managers to proactively look at business directions and take corrective actions before the problem hits. 1KEY BI saves lot of time in analysis over traditional method of reporting. With BI, decisions are taken at right time which improves business performance."

- Zoeb Adenwala, CIO, Essel Propack

About Essel Propack Limited: Essel Propack, part of the USD 2.4 billion Essel Group with turnover of over USD 300 million, is the largest specialty packaging company – manufacturing laminated and seamless or extruded plastic tubes, and medical devices. With over 2700 people representing 20 different nationalities, Essel Propack functions through 25 state of the art facilities in thirteen countries, selling 4.5 billion tubes and continuing to grow every year. Holding a market share of 32% in the laminated tubes domain, Essel Propack leads as the world's largest manufacturer with units operating across countries such as USA, Mexico, Colombia, United Kingdom, Poland, Germany, Egypt, Russia, China, Philippines, Singapore, Indonesia and India. These facilities cater to diverse packaging needs of consumers and include oral care, cosmetics, personal care, pharmaceutical, food and industrial sectors, by offering customized solutions. Visit www.esselpropack.com for more information.

3. APPLYING OLAP TO THE NEEDS OF MANUFACTURERS

Performance is improved by applying essentially the same summarization technique, but the common characteristics and indicator parameters can be quickly changed to answer new questions as they arise. The dimension and measure elements are combined into an OLAP “cube” for analysis. The OLAP cube is powerful enough and specifically designed to do this without costly modifications to system architecture.

The tools available for OLAP analysis allow manufacturers to examine data spanning multiple systems and to compare data across a wide range of subsets including:

- Date/Time
- Shift/Crew/Employee
- Supervisor
- Product (Category/Sub-category)
- Lot/Batch
- Quality code
- Customer
- Machine/Class
- Area/Plant

BI is designed to provide meaningful answers to analytical business questions. Cube building consists of processing measures saved in the BI system to pre-summarize or aggregate data based on the dimensional slicing configured for the reporting system. Measures can be of many formats:

- Length/Width/Thickness measurements
- Temperature and Pressure
- Laboratory values Color/Hardness/Uniformity
- Weight/Quantity
- Time to build/process

Computed values allow for more advanced analysis:

- Average/Range
- Ranking (top 10 worst quality)
- Standard Deviation
- Tolerance variance

The OLAP server performs aggregations with the level and number of aggregations determined by the size and desired performance of the OLAP system. For example, total quantities can be summarized by machine, by shift, and by day to give the best performance for the given server resources. To achieve optimum performance, the OLAP server automatically uses the best aggregation when querying the data set.

Quickly generate established reports

Without cube processing that performs summarization or the use of complex, custom applications that summarize data, reports can take hours to generate, to the point of becoming unusable.

Report performance – Real world example #1

A tire manufacturer used BI to better predict when to replace grinder stones used during a manufacturing process. Whenever tires are ground to correct non uniformity, the grit on the stones wears down, eventually reducing effectiveness and increasing cycle time. A preventative maintenance (PM) crew checks the condition of each stone on a periodic basis, but since each stone's wearing characteristics vary according to the product mix ground and the amount of utilization, the use of calendar scheduling to check stone wear resulted in many stones that were either changed unnecessarily or not changed when they should have been.

The attempted solution was to simply accumulate the grind time by machine and report this information to maintenance. The initial PM report—extremely slow, taking more than a half-hour to generate—was unacceptable.

In a subsequent OLAP solution, the grind stones were identified in a dimension, with a simple dimensional property that clipped out old grind stones as they were replaced by maintenance. Because the OLAP environment aggregates the grind time, the reporting was instantaneous. Maintenance received timely information that allowed them to concentrate their effort on the stones most likely requiring replacement (decreasing machine downtime), with the added benefit of extended grind stone life. This solution was implemented at a low cost since only a minor OLAP change was necessary to keep track of grind stone changes.

Easily create ad hoc reports

BI systems are not only designed differently than traditional On-Line Transactional Processing OLTP database designs, they are fundamentally easier to use.

OLAP displays “drag and drop” report selections that allow the end user to make advanced queries without any programming knowledge. After just a few reports the break even (B/E) point for OLAP reporting can result in significant cost savings.

Ad hoc reporting made easy – Real world example #2

For one supervisor, an end of month task was to export production labor reports into a CSV (Comma Separated Value) file and import the data into an Excel spreadsheet. From there it was the supervisor's task to manipulate the data for monthly performance reports, make scheduling decisions, and generate other labor related reports. This was a high cost operation, not only because of the intense manual effort required but also the cost of lost opportunity—reporting that could have been done but was not due to the difficulty of assembly or the painful wait for an IT programmer to become available to implement any necessary changes.

OLAP installation eliminated the requirement for Excel as a reporting tool and significantly reduced reliance on IT for additional, specialized programming. Excel could still be utilized for some forms of analysis, albeit significantly improved by ProClarity's ability to move data directly from the OLAP environment to an Excel sheet.

Isolate specific problems

The dimensional organization of BI systems allows for easy “drill down” analysis, where data can be sliced and diced to examine different data sets. In many cases manufacturers are looking to compare operations between set standards—machine to machine, shift vs. shift, etc. Using a graphical visualization tool for analysis can help to quickly identify production outliers.

Striking a balance – Real world issue #3

Downstream systems seemed to be starved for components again and again. Maintenance and production personnel could not agree on where the problems originated. BI analysis of machine downtime and maintenance, production output by area, and other key metrics led to several discoveries, including:

- Maintenance staff imbalance. Some areas received too much coverage while other areas received too little, creating downtime ripples.
- Production bottlenecks. Production found that some of their mid-stream machines were not able to produce as expected, requiring expenditure for specific equipment.

Implementation of changes that focused on these discoveries resulted in factory output that increased by an astounding 40% over the next year.

BI systems allow end users to uncover facts that were previously unknown.

Because it gives the end user the ability to drill down into fact tables and to examine, compare, and analyze data, BI is the effective bridge that overcomes the “fact gap.”

Examine issues across multiple systems

Often the data systems within an organization have such limited interaction that creating a report that interacts with two or more systems is complex at best. A major obstacle is that the data is still organized in an OLTP / transactional format. BI technology overcomes these types of problems by design.

QA clues – Real world issue #4

Intermittent quality problems were found during final assembly of a product. The problem did not appear to be associated with a machine or a raw material lot.

The OLAP system was originally designed only to investigate upstream machine calibration issues which might not show up until final assembly. BI allowed the easy addition to the OLAP database of time card information from a Kronos scheduling system. The additional time card information analyzed against the backdrop of the original OLAP data helped management determine that a float operator followed the quality problems downstream.

Integrate new data sources

As with most information systems, the only constant is that the systems will be changing. The architecture in a BI system is generally organized to meet the business needs of end users, rather than the technical needs of the computers.

The addition of new data collection points, new dimensional information, or even completely new data systems can be handled by applying BI technology.

New equipment – Real world issue #5

A sophisticated set of reports already existed, so when they learned that a new product would require an additional manufacturing step, the production team worried about acquiring the new process data and changing the operational reports. Fortunately, that system was already an OLAP system, and integration would add only two dimensional records and extend the fact table. Most of the reporting was already in an online format, so after revising a few reports to reflect the new equipment, the systems were ready for production. Careful design of the OLAP database in advance made the ongoing maintenance simple and very cost effective.

4. COMPONENTS OF A TYPICAL BI FOR MANUFACTURING

Multiple components of a BI tool help manufacturing in following way:

Alerts: Critical alerts and reporting of quality metrics in real time provide crucial monitoring, proactive notification, and automation capabilities that help manufacturers adapt to changing conditions and avoid alarming scenarios pertaining to payables, receivables, budgets, sales, and inventory. With alerts functionality in place, they can pre-set a wide variety of benchmarks in all of these areas and protect from missing key time- or date-sensitive events or failing to respond to deviations from acceptable levels enabling intelligent decision making and action

Inquiry: Having an easy-to-use inquiry tool enables manufacturers to drill down into a specific area and quickly extract data that is essential to business. For example, if they need to examine sales trends by region over the last 12 months, identify the top 5 customers for the quarter, or locate the top 10 best-selling items for the last month, BI tool will serve well.

Analysis tool: Manufacturing companies want the ability to bring in data from multiple locations and still be able to see a unified macro view of the entire enterprise. BI helps achieve this goal-providing a quick snapshot of business and enabling to drill down into sales and purchasing trends, as well as perform budget analysis. Multi-dimensional analysis tool utilizes Excel's capabilities, including pivot tables and charts.

Manufacturing Management Analytics

- **Production Goals**
 - Back Log %
 - Capacity Utilization %
 - System Uptime %
 - Failure Cost Value
 - QC Reject Rate %
- **Inventory Management**
 - Inventory Ageing Days %
 - Inventory ABC Analysis Value
 - Inventory Turns Ratio %
- **New Product Life Cycle**
 - Product Development Cost Value
 - Product Development Lead Time Days
 - Product Milestone Plan V/s Variances

Operational Dashboards: Dashboards that provide real-time visibility into business operations and key risk indicators, allowing users to quickly react to changing market conditions and make timely decisions. Dashboards can be used to acknowledge alerts generated by the activity server or to initiate actions such as generating workflows based on alerts. Each user can personalize his

dashboard with the metrics and alerts that are relevant to his job function. Dashboard provides a graphical snapshot of manufacturing business's health that is easy to understand. Some common categories of data (often from Excel) feeding the dashboard are revenues by period, product sales by category, actual vs. budgeted financial indicators, and expenses by category, just to name a few.

Quick KPI's: Whether analyzing business performance vs. another company or between divisions within a company, quick access to key performance indicators enables to see how business is measuring up at any moment in time. It has the capability to compare financial models and actual performance vs. budget and forecast numbers for different time periods. In addition, it enables to quickly establish benchmarking of results vs. competitors over varying time periods. One can export any KPI report or model to Excel or Word.

Manufacturing Key Performance Indicators

- Production Capacity Trends
- Projected Inventory Surplus
- Days on Hand
- Production Shortage as percentage (%) of Demand
- Inventory Turns
- Production Cycle
- Equipment Utilization percentage (%)

Graphical Presentations of data: Viewing data in graphical format makes the process of analyzing performance so much quicker and easier. BI solution incorporates customizable graphical views (chart) of the data in grid, pivot table, and interactive chart formats. This should be standard feature, not an accessory.

Flexible reporting capabilities: The ability to create and generate reports (including exception reports) that accurately reflect company's key performance data is crucial as is the ability to customize these reports and display them graphically, if needed. In addition, export these reports to an Excel worksheet or include Excel spreadsheet data in these reports.

Remote access: Most decision-makers conduct significant portion of their business while out of office. Thus, it is essential that they have remote access to wide range of their company's vital business data any time they want via web. BI enables to access KPI's such as sales, product and customer analyses, income and balance sheets and inventory reports whenever out of the office.

Report automation: In order to stay ahead of the competition, organizations can't afford to sit back and wait for their IT or accounting departments to provide the information they need to make informed decisions. They must be proactive in automating their entire reporting process—from the creation to generation to distribution of reports across the entire enterprise. Armed with streamlined, high-volume reporting, these companies are equipped to respond to ever-changing market conditions and make the best possible decisions that impact the health of their business.

5. APPLYING BI TO THE NEEDS OF MANUFACTURERS

Some of the areas where BI Solutions can be applied in Manufacturing are:

Inventory optimization

Manufacturing companies have huge inventories to track and move. It's essential for manufacturers to monitor their inventories to reduce over-capacity and ensure sufficient supplies. BI allows manufacturing companies to track inventory usage across location and time, monitor inventory costs and profits through multiple layers of information, and identify inventory overage or obsolete or slow moving inventory. In addition, users can set up alerts for instant notification of low inventory levels.

Inventory KPI's

- Average Item Inventory
- Days of Inventory Supply
- Finished Goods on Hand
- Inventory Costs
- Inventory Turns
- Lease Expenses
- Order Fulfillment Lead Time
- Percentage of Backorders
- Sum of Shipment Lead Times
- Work in Progress Costs

Financial management

Manufacturers need to focus on both external profit building and internal cost reductions to improve their profit margins. Companies can manage their finances by identifying areas where they can increase profits and improve efficiency. BI allows manufacturers to analyze information across multiple sources to set performance goals and create sophisticated profitability and financial models. Manufacturers can develop budgets that incorporate production, operation, sales, fulfillment, and finance figures for optimal forecasting and planning.

BI helps front-line managers improve financial performance with complete, up-to-the-minute information on their department's expenses and revenue contributions. KPI's and reports enable financial managers to improve cash flow, lower costs, and increase profitability while maintaining more accurate, timely, and transparent financial reporting that helps ensure regulatory compliance.

Financial KPIs

- Operating Expense
- Total Sales
- Planning Costs

- Procurement Costs
- Cost of Goods Sold
- Cash-to-Cash Cycle Time
- % POs Invoiced Properly
- Inventory Costs
- Investments
- Raw Material Costs

Supply Chain and Order Management: BI can help deliver deep customer insight into order and inventory data to make better decisions in each stage of the order lifecycle. BI enables assess inventory levels, determine likely product fulfillment needs before the order has been booked, quickly identify potential order backlog issues, and stay on top of critical accounts receivable (A/R) and daily sales outstanding (DSO) issues. By leveraging actionable and fact-based insights, one can transform current Supply Chain and Order Management processes to improve financial performance and customer satisfaction.

With extensive supply chains, manufacturing companies must manage vast amounts of information to optimize the value of each supplier individually and across the entire network. Business Intelligence software allows manufacturers to evaluate supplier performance on a daily basis to better negotiate prices, ensure timely deliveries, and maintain high standards of quality. In addition, BI helps manufacturers identify changes in supply and demand and monitor freight costs. BI provides manufacturers with the tools to increase the efficiency and effectiveness of their supply chains.

Procurement and Spend

BI enables to optimize supply side performance by integrating data from across the enterprise value chain-enabling executives, managers & frontline employees to make more informed decisions. It increases visibility into the complete procure-to-pay process, including comprehensive spend & procurement analysis, supplier performance analysis, supplier payables analysis & employee expense analysis. Through complete end-to-end insight into the factors that impact company performance, one can significantly reduce costs, enhance profitability, increase customer satisfaction, and gain competitive advantage.

Cost management

Manufacturers are always looking to increase their profit margins by reducing costs. BI allows in-depth cost analysis across multiple sources so that companies can track material, manufacturing and production costs through multiple layers of information. Companies can also reduce overhead costs by analyzing and monitoring operational efficiency and identifying areas where they can streamline processes and procedures.

6. BI IN OTHER AREAS OF MANUFACTURING

Price volume mix analysis

Manufacturing companies must process an immense amount of information regarding the pricing and volume of products. By integrating this massive amount of information through in-depth analysis, BI allows companies to gain insight into budget variances and make better placement decisions for products.

Installed base tracking

For many manufacturers, keeping track of where their products are installed gives them tremendous opportunities for post-sales services and additional sales. Having adequate and accurate installed base data is essential if manufacturers want to maximize their profits from this revenue source. BI's comprehensive reporting and monitoring capabilities enable manufacturers to track installed products, as well as the costs and revenues associated with after-sales services to determine the most cost-effective offerings. In addition, users can set up real-time alerts for notification of maintenance schedule requirements to take advantage of additional marketing opportunities.

Warranty analysis

Warranties are one area where manufacturers can greatly reduce costs by ensuring original quality. By analyzing warranty costs, companies can identify possible faulty manufacturing and detect emerging problem areas. Through analysis of warranty claims and call center data, manufacturers can reduce and forecast warranty costs and also identify fraudulent claims.

"BFL, world's largest forging conglomerate was collecting a massive amount of manufacturing, customer & business data through a variety of channels & we needed a way to aggregate understand & analyze that information. BI enables us to assemble all the relevant data for the business users logically & in a structured, aesthetically pleasing & presentable reporting format. BI enables rich analysis, handling large data volumes, single consolidated interface for SAP & non-SAP data. Business users in functional areas are able to better manage demand, product lifecycle and supply chain performance, access & analyze data over the Web as well, enabling them to better manage their business. BI enables us to better manage our manufacturing, sales and Business. It consolidates process and analyzes data from multiple data sources including SAP & EXCEL, and presents the Sales & Cost Control data in more intuitive format. Through analysis of costing profit & loss account, the organizational managers are empowered to not only report the variances, but also help the management & process heads to monitor the activities as they happen, with the use of Dashboards and KPI's beyond other analytical reports. 1KEY BI reduces time to decision as data collation & presentation time is getting reduced."

Yogesh Zope, Vice President, IT Services, Bharat Forge Limited.

About Bharat Forge Limited: Bharat Forge Ltd., the flagship company of the US \$ 2.4 billion Kalyani Group, is a leading global "Full Service Supplier" of forged and machined - engine & chassis components. It is the largest exporter of auto components from India and leading chassis component manufacturer in the world. With manufacturing facilities spread across 12 locations and 6 countries - four in India, three in Germany, one each in Sweden, Scotland, USA and two in China, the company manufactures a wide range of safety and critical components for passenger cars, SUV's, light, medium & heavy commercial vehicles, tractors and diesel engines. The company also manufactures specialized components for the aerospace, power, energy, oil & gas, rail & marine, mining & construction equipment, and other industries. It is capable of producing complex large volume parts in both steel and aluminum. Visit www.bharatforge.com for more details.

7. IS THERE A WAY OUT?

BI is very effective for all types of manufacturing be it process, discrete, or automotive. BI can close the “fact gap” by improving the availability and delivery of actionable data with minimal IT involvement.

Manufacturers should carefully consider using BI as a cost effective way to improve operations.

BI for manufacturing industry leverages all the sources of data available throughout the manufacturing process to deliver a holistic view. Smart decisions must be based on data that accurately reflects the true state of the entire manufacturing process.

“Given the fiercely competitive nature of automotive industry working to balance demand in new markets with overcapacity in others, effective use of information is vital to success. Companies in our industry have to give access to that actionable piece of information in forms that support the long term goals and needs of such companies. Successful automotive manufacturing demands that a continuous stream of real-time customer, supplier and competitive information be available throughout the supply chain. Sales and quality management, product development, and production decision making are particularly dependent on timely and accurate information. Capturing and sharing actionable business intelligence is critical to achieving desired automotive business outcomes, specifically improved product innovation, quality, and overall customer experiences. 1KEY BI makes this possible.”

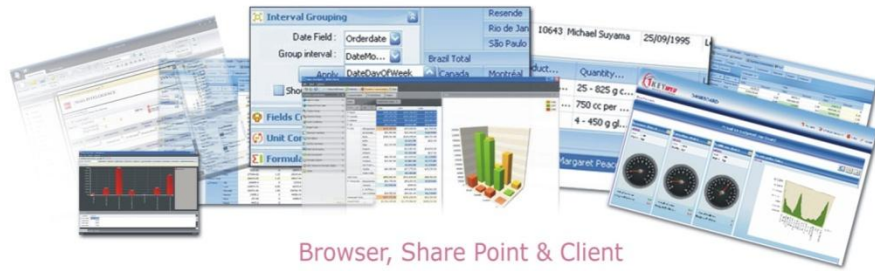
Umesh Mehta, CIO, Asia Motor Works Limited

About Asia Motor Works (AMW): Established in the year 2002, Asia Motor Works Ltd. with 788 employees and around 788 crores turnover is a leading company in highly competitive Heavy Commercial Vehicles industry. AMW specializes in design and manufacture of high tonnage vehicles on a hybrid platform. AMW having its manufacturing facility in Bhuj with a manufacturing capacity of 24000 fully built vehicles is in the process of rolling out a vast and dependable, nationwide sales service and spares network, comprising 30 Main Dealers and 450 sub dealers. Visit www.amwasia.com for more details.

“With constant growth, multi product and multi-location, there was a challenge to cater to information needs of middle level managers. In a manufacturing business like this there is lot of need to review, analyze and take action at both macro and micro level. And hence we need to organize data in a manner where you can quickly see the trend; we can quickly see the exceptions and take the necessary action. 1KEY BI allowed us to roll ad-hoc MIS reporting out across the entire organization to various people at all the levels. We find 1KEY more useful for day-to-day dynamic reporting, which is required to be done across the organization, by most of the users. 1KEY BI quickly addresses the information needs of company’s operations like sales finance and accounts. We could resolve complex analysis of multiple products within a division at product level, SKU level, and location level with 1KEY BI.”

Apurva Parekh, Director, Pidilite Industries Limited

About Pidilite Industries Limited: Pidilite is the market leader in construction chemicals segment with a turnover of US \$ 350 million. Brand name Fevicol has become synonymous with adhesives for millions of consumers and industrial users. The company’s products range includes adhesives, sealants, construction & paint chemicals, automotive chemicals and art material. Visit www.pidilite.com for more details.



Browser, Share Point & Client



FILE READER
REPORTER
CHART

QUERY EXPERT
OLAP
CONSOLE

WEB VIEW
CUBE

VIEW
SCHEDULER

WEB TREE
KPI
TICKER

WEB CUBE
TREE
DASHBOARD

Browser

Share Point

Client

Presentation Layer

View & Cube Reporting



Graphical Analysis



Visually Stunning Dashboards



KPI

Qty	Sales
★ 30	↑ 359,999.00
★ 21	● 216,000.00

Business Intelligence Platform

• Role Based Security



- Administration
- Business Logic
- Repository

Report Scheduling & Meta Data Server



Data & Application Integration

Meta Server



Query Expert



Metadata



OLAP

- MAIA OLAP
- SAP B/W
- SQL Analysis Server
- DB2 Cube Views

Databases



ORACLE

DB2
MySQL

Microsoft
SQL Server
SYBASE

3rd Party Applications



MAIA Intelligence

MAIA Intelligence is a software product company in Business Intelligence (BI) MIS reporting and analysis space. MAIA Intelligence, a young and innovative company is committed to developing powerful yet affordable and scalable BI solutions, has emerged as a growing entity in the market place. MAIA Intelligence's flagship offering 1KEY BI caters to strategic, tactical and operational user's requirements across the organization with a self-serve BI tool for dynamic MIS, ad-hoc reporting and complex analysis. With its mission to democratize BI, MAIA has made BI available to masses. Commenced in the year 2006, MAIA Intelligence, has always strived to meet the needs of corporate implementations, application service providers and value-added resellers. MAIA's innovation has revolutionized the way BI can be deployed. With installation & database connectivity happening in 2 working days, organizations are ready to deploy BI from the 3rd day with instant dynamic reports. For further information on MAIA Intelligence and its offerings, visit www.maia-intelligence.com.



1KEY Business Intelligence Software, helps companies take informed and better decisions at all levels.

1KEY BI is developed on Microsoft .NET Framework 3.5. It has been specifically designed to cater to high levels of simultaneous access to huge data reporting on various platforms of Windows and databases. 1KEY BI can accommodate thousands of users, connect multiple applications, integrate disparate data sources and deliver visually stunning, multi-formatted and flexible cross functional reports and analytics.

The solution connects and communicates to all type of applications, irrespective of the database used at the backend. It helps the organizations to analyze and derive more meaningful and accurate information that will facilitate faster and, consequently profitable business decisions. 1KEY BI provides visual reporting and guided analysis for business users. 1KEY BI software product is geared toward business users with needs not met within their existing BI tools. It provides a very intuitive, interactive and highly visual interface that lets users see problems, both summary and details, in a very understandable way.

1KEY BI caters to any industry vertical including Manufacturing, Banking, Financial Services and Insurance (BFSI), Healthcare & Pharmaceutical, Services, Construction & Allied, Public Sector, Information Technology Enabled Services (ITES), Retail, Logistics, and Hospitality. The solution caters to the reporting and analysis demands of business users across the organization in all horizontals like Purchase & Procurement, Manufacturing & Distribution, Sales & Marketing, HR, and Finance & Accounts.

1KEY consists of wide range of components, with a variety of features to suit different business requirements.